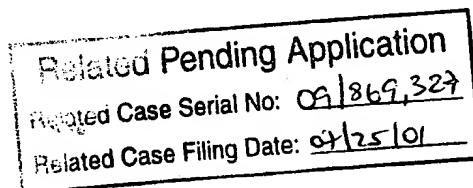
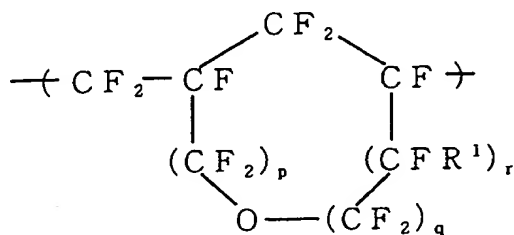


CLAIMS

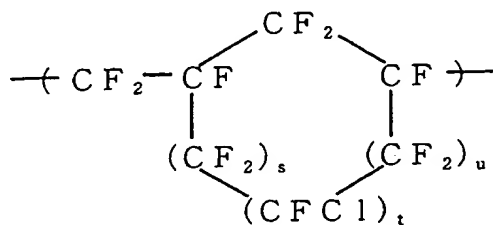
1. A polymer electrolyte fuel cell comprising a polymer electrolyte made of an ion exchange membrane, catalyst layers disposed on both sides thereof, and current collectors disposed on the outer sides of the catalyst layers, wherein the current collectors are made of a porous sheet having a solvent-soluble fluorine-containing polymer having substantially no ion exchange groups, deposited on its surface.
2. The polymer electrolyte fuel cell according to Claim 1, wherein the solvent-soluble fluorine-containing polymer is a polymer having a fluorine-containing aliphatic ring structure.
3. The polymer electrolyte fuel cell according to Claim 2, wherein the fluorine-containing polymer contains polymer units of the following formula 1, 2, 3 or 4; provided that in the formula 1, R^1 is a fluorine atom or a trifluoromethyl group, p is an integer of from 0 to 5, q is an integer of from 0 to 4, r is 0 or 1, and $p+q+r$ is from 1 to 6, in the formula 2, each of s , t and u which are independent of one another, is an integer of from 0 to 5, and $s+t+u$ is from 1 to 6, in the formula 3, each of R^2 and R^3 which are independent of each other, is a fluorine atom or a trifluoromethyl group, and in the formula 4, v is 1 or 2:





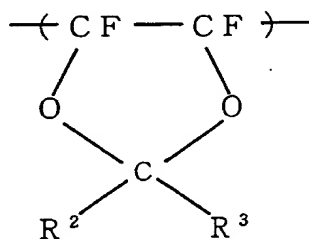
... Formula 1

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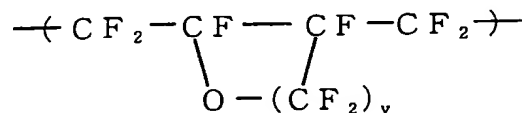
... Formula 2

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... Formula 3

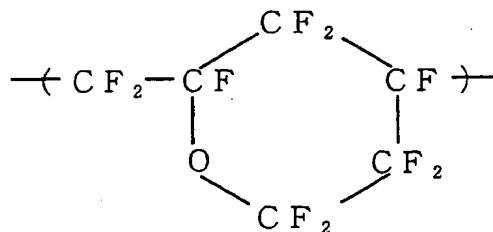
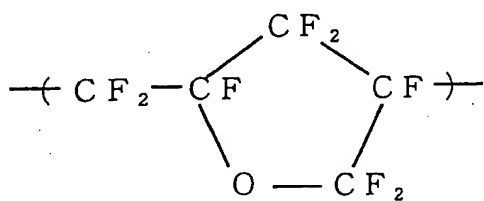
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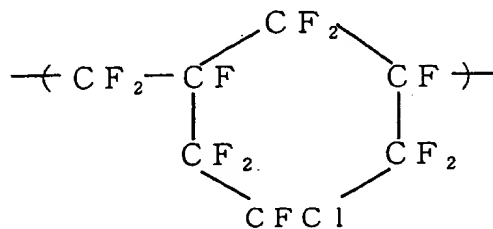
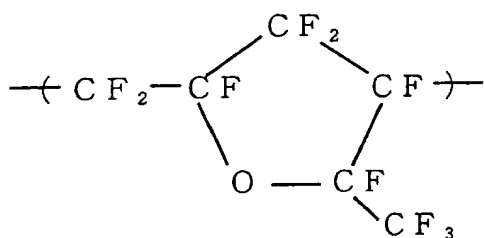
... Formula 4

4. The polymer electrolyte fuel cell according to Claim
 2, wherein the fluorine-containing polymer contains
 20 polymer units represented by any one of the following
 formulae 5 to 13:

5



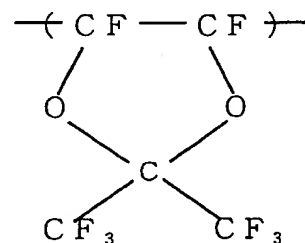
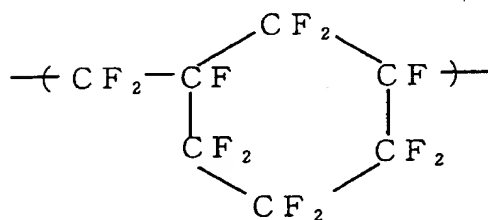
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... Formula 7

... Formula 8

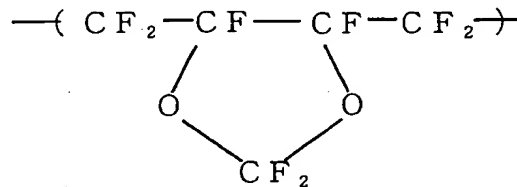
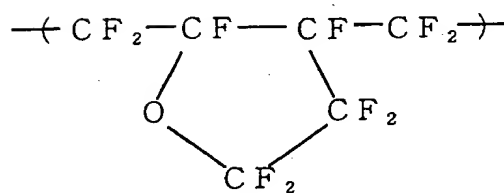
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... Formula 9

... Formula 10

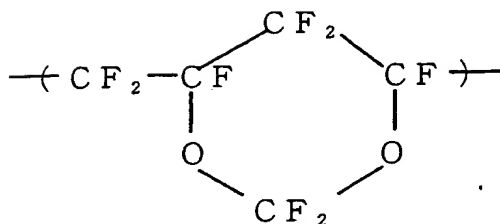
20



... Formula 11

... Formula 12

25



... Formula 13

5. The polymer electrolyte fuel cell according to Claim 1, 2, 3 or 4, wherein the fluorine-containing polymer is contained in the current collectors in an amount of from 0.001 to 60% based on the total mass of the current collectors.
6. The polymer electrolyte fuel cell according to Claim 1, 2, 3, 4 or 5, wherein the porous sheet is made of a carbonaceous material.
7. The polymer electrolyte fuel cell according to Claim 1, 2, 3, 4, 5 or 6, wherein the porous sheet has a thickness of from 0.1 to 1 mm and a porosity of from 30 to 90%.
8. A method for producing a polymer electrolyte fuel cell, which comprises disposing catalyst layers on both sides of a polymer electrolyte made of an ion exchange membrane, and further disposing current collectors made of a porous sheet on the outer sides of the catalyst layers, wherein the current collectors are obtained by impregnating or spraying a solution having a solvent-soluble fluorine-containing polymer having substantially no ion exchange groups, dissolved in a solvent, to the porous sheet, to deposit the fluorine-containing polymer on the porous sheet.
9. The method for producing a polymer electrolyte fuel cell according to Claim 8, wherein after depositing the fluorine-containing polymer on the porous sheet, the

porous sheet is heated at a temperature of from 100 to 250°C.

10. The method for producing a polymer electrolyte fuel cell according to Claim 8 or 9, wherein the solvent is a
5 fluorine-containing solvent, and the concentration of the solute in the solution is from 0.01 to 50% based on the total mass of the solution.

ABSTRACT

A polymer electrolyte fuel cell comprising a polymer electrolyte made of an ion exchange membrane, catalyst layers disposed on both sides thereof and current
5 collectors disposed on the outer sides thereof, wherein a solvent-soluble fluorine-containing polymer (preferably a polymer having a fluorine-containing aliphatic ring structure) having substantially no ion exchange groups, is incorporated in the current collectors.

10 By the above construction, the current collectors can have a high water repellency for a long period of time, and the polymer electrolyte fuel cell can operate at a high output density constantly over a long period of time.